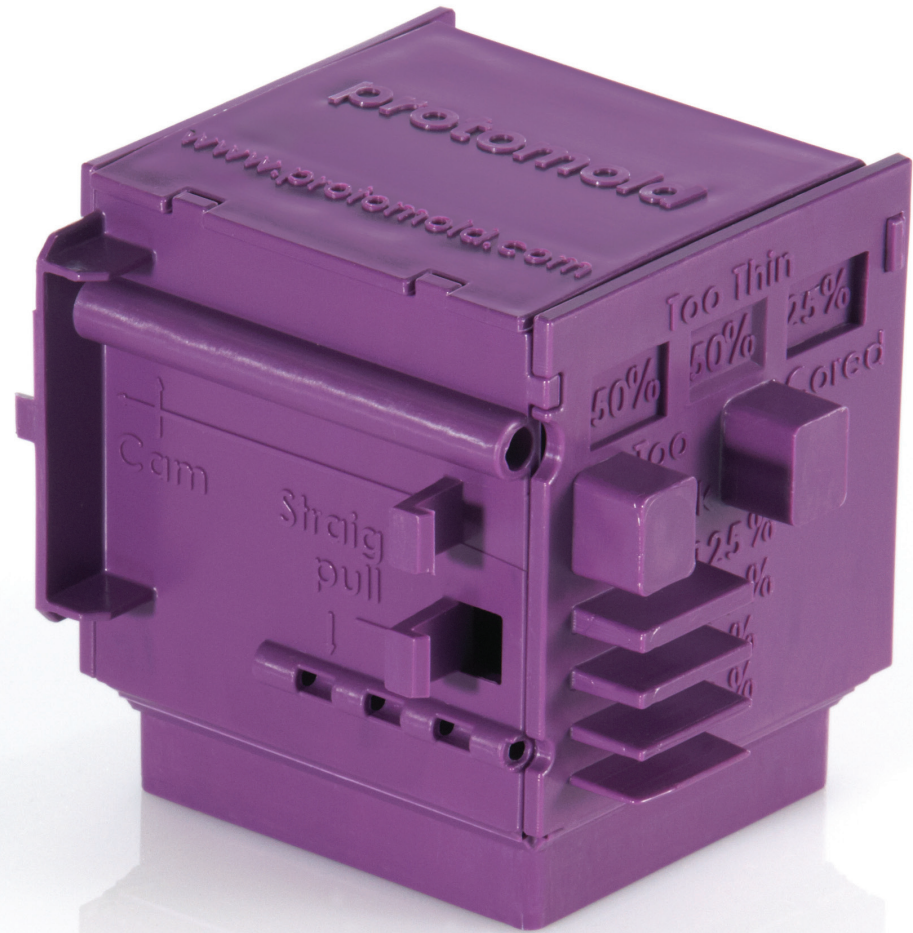


Injection Molded Design Cube

Your design cube illustrates several important design considerations for any part to be injection molded. Keeping these in mind during the design process will help you avoid the most common pitfalls, and help us make better parts for you even faster. It also shows different surface finish options available from Protomold.



See back of card for design key.

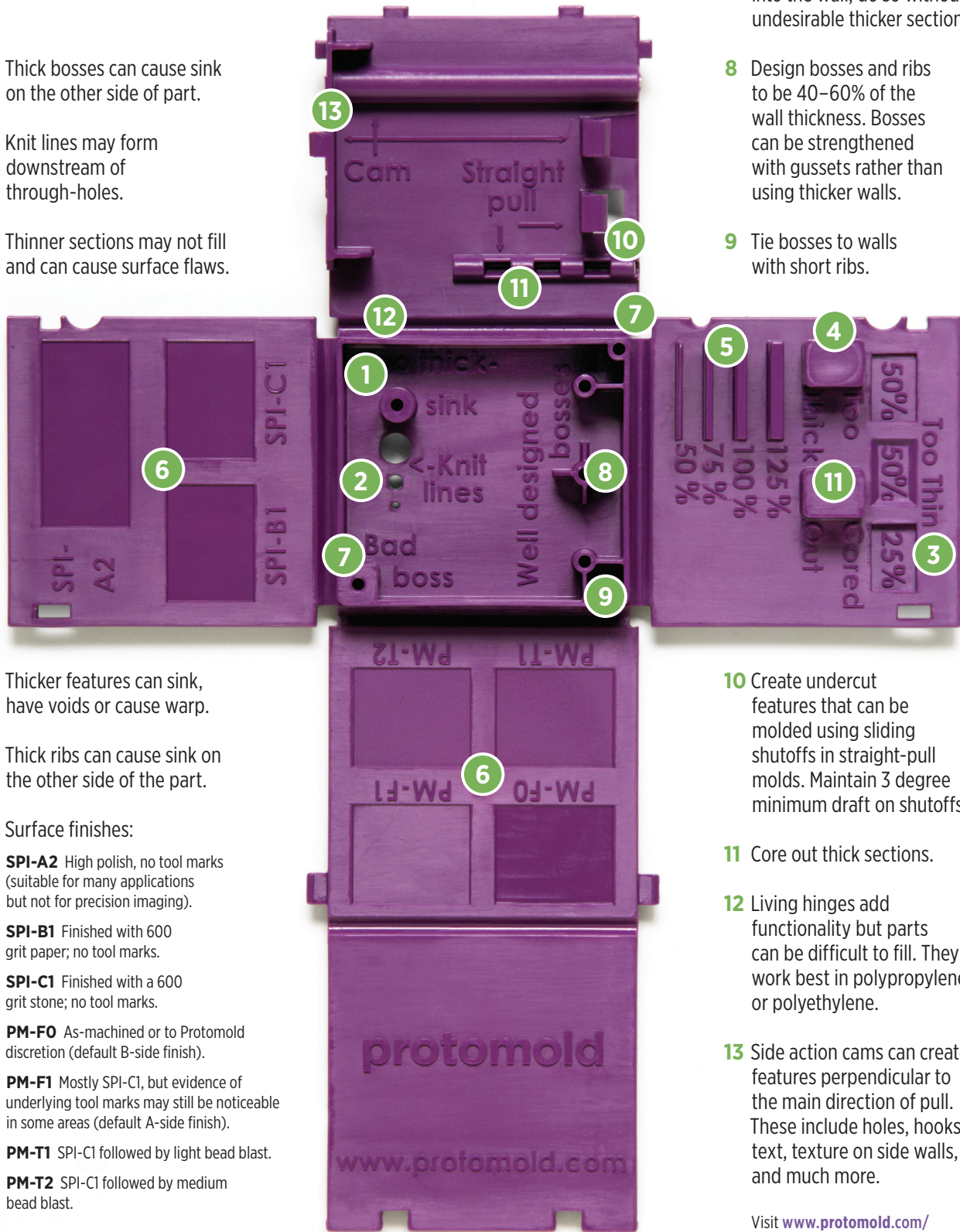
Upload your 3D CAD model at www.protomold.com and receive a quote within hours. Our custom web-based ProtoQuote® interactive quote allows you to change quantity, materials and requested delivery time to get real-time mold and piece part pricing.

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Injection Molding Service

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DESIGN SUGGESTIONS

- 1 Thick bosses can cause sink on the other side of part.
- 2 Knit lines may form downstream of through-holes.
- 3 Thinner sections may not fill and can cause surface flaws.



- 7 If you incorporate the boss into the wall, do so without undesirable thicker sections.
- 8 Design bosses and ribs to be 40–60% of the wall thickness. Bosses can be strengthened with gussets rather than using thicker walls.
- 9 Tie bosses to walls with short ribs.

- 4 Thicker features can sink, have voids or cause warp.
- 5 Thick ribs can cause sink on the other side of the part.
- 6 Surface finishes:

SPI-A2 High polish, no tool marks (suitable for many applications but not for precision imaging).

SPI-B1 Finished with 600 grit paper; no tool marks.

SPI-C1 Finished with a 600 grit stone; no tool marks.

PM-F0 As-machined or to Protomold discretion (default B-side finish).

PM-F1 Mostly SPI-C1, but evidence of underlying tool marks may still be noticeable in some areas (default A-side finish).

PM-T1 SPI-C1 followed by light bead blast.

PM-T2 SPI-C1 followed by medium bead blast.

- 10 Create undercut features that can be molded using sliding shutoffs in straight-pull molds. Maintain 3 degree minimum draft on shutoffs.
- 11 Core out thick sections.
- 12 Living hinges add functionality but parts can be difficult to fill. They work best in polypropylene or polyethylene.
- 13 Side action cams can create features perpendicular to the main direction of pull. These include holes, hooks, text, texture on side walls, and much more.

Visit www.protomold.com/designguidelines for more tips on design.